

UPGRADE
WORKSHOP

Fitting a sound card

If you need to fit a new sound card to your PC to enjoy the best that movies and games have to offer, Simon Handby has some sound advice on how to go about it

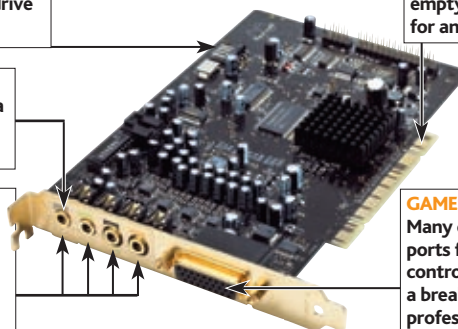
CD AUDIO Windows defaults to digital CD playback, so connecting your optical drive to this analogue connector is optional

DIGITAL PORT On most general-purpose cards, one socket doubles as a digital interface. You'll need to buy a mini-S/PDIF-to-S/PDIF lead to use it

3.5MM SOCKETS Each of these small ports accepts a stereo mini-jack for analogue input or output. Cards supporting 5.1-channel sound have at least three, those offering 6.1 or 7.1-channel sound have four or more

PCI INTERFACE You'll need an empty, unobstructed PCI slot for an internal card such as this

GAMES/BREAKOUT PORT Many cards have additional ports for connecting older game controllers, MIDI controllers or a breakout module with a set of professional-type connectors



INTRODUCTION

Motherboards used to be fairly simple affairs, with little in the way of extras such as a built-in network port or sound card. But with the rise of broadband, MP3s and video on the PC, it's now almost impossible to buy a desktop or notebook computer that doesn't come with at least a stereo sound chip. Nevertheless, you may find that the basic features or lacklustre sound quality of some onboard audio isn't good enough for games or music.

Whether you use a notebook or desktop PC, you can buy a third-party sound card that will get better results from a surround-sound speaker set in movies and games. There are also several affordable sound cards that come with high-quality components and professional inputs suitable for music production.

In this guide, we'll help you choose a sound card with the right ports and features, and show you how to install and configure it in your computer.

Simon Handby

Printers and audio expert

simonh@computershopper.co.uk



You can buy sound cards that fit in a spare PCI slot inside a desktop PC, or that connect to a PC or notebook via USB. There are also some CardBus devices, suitable for a notebook's PC Card slot, and FireWire cards. Here we'll focus on USB and PCI devices, which are the most common.

Before you buy, you should check the capabilities of your existing sound card. Many PCs built within the past three years already have multi-channel onboard sound, and some have an optical digital output. Check your computer's specification, and if necessary refer to the manufacturer's website for support or updated drivers.

PCI cards are neater, cheaper and may be better specified than external USB ones, but they're less easy to fit and configure. USB devices are simple to install and can be moved easily between compatible PCs and notebooks. Most USB sound devices require a USB2 specification port. If your motherboard manual doesn't specifically mention USB2, it's likely your computer's ports work only at USB1.1.

Choose a sound card designed for the sort of use you have in mind. In Windows XP, any general-purpose 5.1-channel sound card will play surround sound from a DVD, provided your DVD playback software includes a suitable decoder. Surround-sound games should also work up to the maximum number of channels that both they and your sound card support. Some cards support additional proprietary standards, such as Creative's EAX processing, which modifies the ambience of a sound track to match the setting in games. These can improve realism, but not all games support EAX.

Windows Vista handles 3D sound differently to Windows XP, where it's incorporated into Direct X and hardware-accelerated by your sound card. In Vista, this hardware acceleration isn't available to DirectX applications, so performance might be slower. Audio effects that rely on hardware acceleration work only if both the sound card and game support OpenAL. You can read more about the problem, and a solution for Creative X-Fi sound cards, at www.tinyurl.com/222smg.

Compatibility checklist



CONNECTION

For a USB card you'll need a spare USB2 port, so check your computer's motherboard manual for specific mention of USB2 (not just USB). Connecting via a USB hub may cause problems. If you're fitting a PCI card, check you have one free PCI slot, away from your graphics card if possible. Some cards require a second PCI slot or a free 5¼in drive bay for their connection modules.



INPUTS AND OUTPUTS

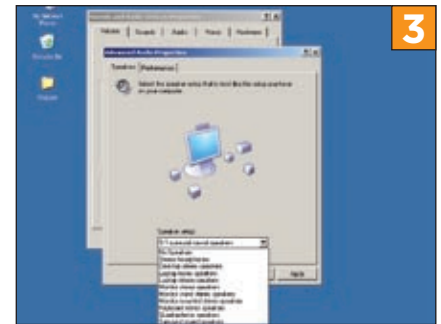
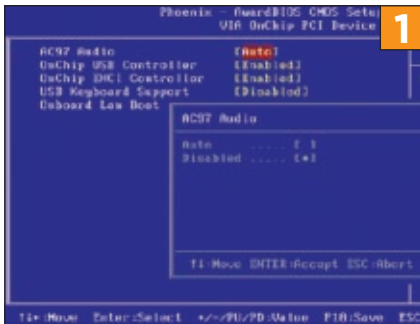
All general-purpose cards have 3½mm analogue sockets for mic/line inputs and headphone/speaker outputs. Surround-sound cards have up to four output sockets, and often an optical mini-S/PDIF port. Audio-production cards typically have sockets for professional connectors, such as XLR (left, above) or ¼in instrument jacks (right). Audio cables don't come in the box, so you may need to buy some.



DRIVERS AND FORMATS

Before you buy a card, check that it's compatible with your version of Windows. This is vital with Vista, as not all manufacturers have released drivers. Even where a card has a Vista driver, you may find that the software is incompatible or that advanced features are unavailable. Visit the manufacturer's website for the latest information, and read any driver release notes carefully.





If your PC speakers have analogue inputs only, you must buy a card with a suitable number of analogue outputs. If your speaker set has a digital input – or if you wish to connect to a digital amplifier or surround-sound decoder – you'll need a sound card with the appropriate type of S/PDIF digital output (coaxial or optical).

For music production, look for a device with suitable ports. Studio microphones use an XLR connector, and you'll need sockets with phantom power to use a condenser capacitor mic. Instruments normally connect using a 1/4in mono jack plug; make sure the device inputs can handle either line level, or quieter instrument inputs such as those from an unamplified guitar. You'll need at least two inputs to record a stereo source.

Music sound cards usually have a headphone socket, but no digital output. Most produce a monitor output via two mono 1/4in sockets, designed to be connected directly to a studio amplifier or monitor speakers. If you produce music, you must be able to synchronise recording and playback with each other, and also with any electronic instruments that are connected to your computer. You'll need audio stream input/output (ASIO) drivers to do this accurately, so make sure they're available for your device.

INSTALLATION

Installing a USB card is easy. You'll need to open your PC's case to install a PCI card, but it should still be straightforward if you work with care. If your computer doesn't have an existing sound device, go straight to Step 2.

1 REMOVE OR DISABLE ANY EXISTING DEVICES

If you already have a sound card, we recommend that you remove or disable it to reduce the likelihood of any conflicts. In Windows XP, click Start, Settings and open the Control Panel. Double-click the Add or Remove Programs icon. In the list that appears, find the drivers for your existing sound card and remove them.

If you have a built-in sound card, restart your PC when this completes, but enter its BIOS rather than booting into Windows. If you don't know how, check your manual or the manufacturer's website. Find the settings for onboard devices and disable the sound chip. Now proceed to Step 2.

If you have any other type of sound card, shut down your computer and disconnect it. You'll need to open your PC case to remove an existing PCI card. You'll find instructions on how to do this in your computer's manual.

2 INSTALLING

Your sound card will come with a quick setup guide that contains exact installation instructions. As a general guide, you'll need to install the software for a USB device before you connect it. After you connect it, your computer should automatically detect and configure it within a minute or so. You can now go to Step 3.

You should insert a PCI sound card before installing its software, unless the setup guide says otherwise. Power off your computer and open its case, moving it to a suitable workbench if necessary. Find a spare PCI slot and remove any blanking plates from the back of the slot. Depending on your case, the plate may be secured with a clip, screw or both. Check the slot for obstructions before fitting the new card, which you should handle only by the edges, avoiding any connectors or components.

Ensure the card's connector is parallel with the PCI slot, and carefully insert it by pushing down evenly on both ends. Make sure you keep the slot and connector aligned, and that the bottom of the plate engages with your case. You may not get it right first time, but you shouldn't need much force once it's correctly aligned. Secure the card with a screw or by fastening the clip. If you have a CD Audio cable, connect it between your optical drive and your new card.

EXPERT TIP
Touch the unpainted part of a radiator to dispel any static electricity before you handle a PCI sound card.

Close your computer's case and boot into Windows, cancelling the Found new hardware wizard if it starts, and insert the disc that came with the device to install the drivers and other software.

3 CONNECTING AND CONFIGURING

Now you can connect your card to your other audio equipment. If both have an optical SPDIF port, you should connect it using a fibre-optic cable. If you're connecting analogue speakers, follow the colour coding or labels to ensure you get the connections the right way round.

If you have stereo or 2.1-channel speakers, connect them to the green port, labelled line-out 1. This port is also used for the front left and right speakers in a surround-sound setup. Connect the rear speakers to the black port, labelled line-out 2, and the centre/sub to the orange port labelled line-out 3. Manufacturers use different solutions to connect the remaining speakers in a 6.1 or 7.1-channel setup, so refer to their install guide if you need further help.

Finally, you'll need to configure Windows and your software correctly. From Windows XP's Start menu, select Settings and open the Control Panel. Run the Sounds and Audio Devices applet and click Advanced on the Volume tab. Make sure the correct speaker configuration is selected in the drop-down box before clicking OK to close both dialog boxes.

In Windows Vista, click the Start button and type 'sound' into the search box. Double-click the Sound applet that appears under Programs, select your device and click the configure button. You can also use this applet to test your speaker positions and connections.

Whichever Windows version you have, you may also need to check and adjust the audio setup within your games and DVD-playback software, and in Windows Media Center if you have it. 

Testing and troubleshooting

You should hear that your sound card's basic functions are working when you first boot or shut down Windows, but listen to an MP3 file or CD, too. During playback, use the sound card's control interface or Windows' volume applet in the Notification Area to fine-tune sound. Most amplifiers and PC speakers let you change basic tone settings. Run any software, and check it behaves as expected.

Windows XP users can check surround-sound speaker placement and connections using a utility such as RightMark 3DSound, available from www.tinyurl.com/2z6mm2. If

you're using your card for production, you can measure its signal-to-noise performance with Audio Analyzer, available from the same location.

TROUBLESHOOTING

If there's no sound, double-check your audio connections and that your speakers are turned on. Be careful to set the volume to a low to medium level until you've solved the problem, particularly if you're using headphones.

If your connections are fine, right-click My Computer (Computer in Windows Vista), select Manage and highlight Device Manager in the

left-hand pane. Check in the Sound, video and game controllers group that no devices have an exclamation mark. Check also that no sound devices appear with an exclamation mark under Other devices. If so, uninstall any sound drivers or software and start again.

If your games or DVDs don't sound as you expected, check that your sound card and software are correctly configured for your speaker setup. Check also that you have the necessary plug-ins, codecs or driver updates. Visit the support webpages for your device and for the relevant software to check.